CLAIMS

1. A liquid thermosetting ink for ink-jet applications, comprising
   a. one resin or more;
   b. at least one solid latent curing agent characterized by a maximal particle size of less than 2 microns;
   c. an inert filler having fine particles;

   wherein said single-pack or two-pack ink is characterized by a viscosity lower 50 Cp at application temperature, surface tension lower 80 dyn/cm at application temperature, and glass transition temperature of cured ink of greater than 120°C.

2. A liquid thermosetting epoxy-based ink according to claim 1, comprising an epoxy-based resin; wherein said ink is characterized by a viscosity which lower 20 Cp at application temperature; surface tension ranging from 24 to 34 dyn/cm at application temperature, and glass transition temperature of cured ink of greater than 120°C.

3. The ink according to claim 2, wherein the curing agent is selected from compositions containing modified amines, urea derivatives, imidazoles, dicyandiamide, inorganic boron salts or any mixture thereof.

4. The ink according to claim 2, especially adapted for solder mask applications.

5. The ink according to claim 2, especially adapted for bonding devices or components in the electronic manufacturing.

6. The ink according to claim 2, especially adapted for printing electronic manufacturing of passive component capacitors and/or resistors.

7. The ink according to claim 2, especially adapted for conductive lines and features printing electronic manufacturing, lines, pads and/or bumps.

8. The ink according to claim 2, wherein the major portion of the epoxy comprising polymers selected from DGEBA, EPN, ECN, DGEBF, commercially available bisphenol A based novolac products or any combination thereof. Need More

9. The ink according to claim 2, additionally comprising reactive diluents and/or monoepoxides.

10. The ink according to claim 9, wherein the diluents and/or monoepoxides are selected from aromatic, heterocyclic, and/or cycloaliphatic compositions.

11. The ink according to claim 2, additionally comprising impact modifiers and/or flexibilizers having rubbery moieties or blocks in their chain.

12. The ink according to claim 11, wherein the impact modifiers and/or flexibilizers are selected from amines; epoxies; hydroxy terminated rubbers; rubber-like compositions comprising polybutadienes, polyisoprenes, hydrogenetaed polybutadienes and/or polyisoprenes, ethylene-propylene copolymers, polydimethyl siloxane elastomers; or any mixture thereof. Need More

13. The ink according to claim 2, additionally comprising adhesion promoters.

14. The ink according to claim 13, wherein the adhesion promoters are organometallic compounds selected from siloxane, zirconate, titanate, aluminate or any mixture thereof.

15. The ink according to claim 2, wherein the curing agents are activated by means of an effective actinic irradiation.

16. The ink according to claim 2 additionally comprising monomers and/or oligomers that are selected from styrene, acrylic, methacrylic acid and esters thereof; acrylated or methacrylated epoxies; urethane containing oligomers; or any mixture thereof. Need More

17. The ink according to claim 2, additionally comprising photoinitiators and secondary thermal initiators adapted to initiate and cure unsaturated ingredients.

18. An Non halogenated flame retardant ink according to claim 2, additionally comprising amino resins characterized by an impart adhesion and/or high cross-link density selected from melamine-based resins, urea resins, benzoguanamine resins or any mixture thereof.

19. The ink according to claim 2 additionally comprising mineral fillers, having maximal particle size of 2 micron in final concentration ranges between 1 to 30% by weight.

20. The ink according to claim 19, wherein the mineral fillers are characterized by a maximal particle size of about 300 nm.

21. The ink according to claim 2, additionally comprising additives selected from surface active agents and/or colloid stabilizers; rheology modifiers; pigments and dyes; matting agents; solvents; co-solvents; diluents and mixture thereof.

22. The ink according to claim 21, wherein the solvents; co-solvents or diluents are at least partially volatile or unsaturated.

23. A method for producing a liquid thermosetting ink for ink-jet applications, comprising *inter alia* the steps of:
    a. dissolving at least one solid latent curing agent or its precursors, characterized by fine particles in a solvent to form a clear solution;
    b. admixing an inert filler having maximal particle size of 2 microns with the solution obtained above to form a homogenized dispersion;
    c. precipitating said curing agent as a layer or in the form of small crystals onto said filler surface and/or inside the internal porosity of said filler;
    d. evaporating said solvent;
    e. drying or concentrating the same; and,
    f. admixing a predetermined measure of ink composition;

    in the manner that one-pack or two-pack ink characterized by a viscosity lower 50 Cp at application temperature, surface tension lower 80 dyn/cm at application temperature, and glass transition temperature of cured ink of greater than 120°C is obtained.

24. The method according to claim 23, wherein the curing agent is admixed up to a measure that curing agent to filler weight ratio is ranges 0.01:100 to 50:100 respectively.

25. The method according to claim 23 wherein deposition of the curing agent onto the filler carrier is provided by means selected from introducing of at least one another solvent to the said admixture; changing the temperature; pH shifting; altering electrolytes concentration, spraying agent solution on filler particles, or any combination thereof.

26. The method according to claim 23, additionally comprising the step of stabilizing the obtained slurry by means of admixing a sufficient measure of dispersing agents and/or rheology modifiers.

27. The method according to claim 23, wherein the one-pack or two-pack ink is adapted for solder masks, electronic passive components printing, or adhesives applications.

28. The method according to claim 23, comprising *inter alia* the steps of:
    a. dissolving fine particles of at least one solid latent curing agent in a solvent to form a clear solution;
    b. admixing an inert filler having maximal particle size of 2 microns with the solution obtained above to form a homogenized dispersion;
    c. precipitating said curing agent as a layer or in the form of small crystals onto said filler surface and/or inside the internal porosity of said filler;
    d. evaporating said solvent;
    e. drying or concentrating the same;
    g. admixing a predetermined measure of epoxy-based resin;

    in the manner that one-pack or two-pack liquid thermosetting epoxy-based ink adapted for ink-jet applications, characterized by a viscosity which lower 20 Cp at application temperature; surface tension ranging from 24 to 34 dyn/cm at application temperature, and glass transition temperature of cured ink of greater than 120°C is obtained.

29. The method according to claim 28, wherein the one-pack or two-pack ink is adapted for solder masks, electronic components, or adhesives applications.

30. The method according to claim 23, wherein at least a portion of the precursors of the curing agent are admixed with the filler at the reaction medium.

31. The method according to claim 28, wherein at least a portion of the precursors of the curing agent are admixed with the filler at the reaction medium.

32. A method for producing a liquid thermosetting ink for ink-jet applications, wherein the filler particles are coated in at least a significant portion of their surface with solid latent curing agents; said method comprising *inter alia* the step of spaying at least one solid latent curing agent or its precursors, characterized by fine particles in a solvent to form a clear solution towards particles of inert filler, having maximal particle size of 2 microns with the solution obtained above to form a homogenized dispersion; and finally, admixing a predetermined measure of ink composition in the manner that one-pack or two-pack ink characterized by a viscosity lower 50 Cp at application temperature, surface tension lower 80 dyn/cm at application temperature, and glass transition temperature of cured ink of greater than 120°C is obtained.